

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing
(day/month/year)

Applicant's or agent's file reference

PCT05020

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/JP2005/017277

International filing date (day/month/year)

20.09.2005

Priority date (day/month/year)

21.09.2004

International Patent Classification (IPC) or both national classification and IPC

Applicant

NTN CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Date of completion of this opinion

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/017277

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:



the international application in the language in which it was filed



the translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rule 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material



a sequence listing



table(s) related to the sequence listing

b. format of material



on paper



in electronic form

c. time of filing/furnishing



contained in the international application as filed



filed together with the international application in electronic form



furnished subsequently to this Authority for the purposes of search

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/017277

Box No. IV

Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
- ☒ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:

The "special technical feature" of the inventions of claims 1 to 6 is establishment of the dimension relation $L2 < L1$, $L2 > A$ for a double-row self-aligning roller bearing when the length of a spherical roller in one row is $L1$, the length of a spherical roller in the other row is $L2$, and the major axis of a contact ellipse produced on a contact surface between the spherical roller in the other row and a raceway ring is A , the "special technical feature" of the inventions of claims 7 to 12 is establishment of the dimension relation $N1/R1 > N2/R2$ for a double-row self-aligning roller bearing when the curvature radius of the ridge line of a spherical roller in one row is $R1$, the curvature radius of the ridge line of a spherical roller in the other row is $R2$, the curvature radius of the inner raceway surface in contact with a spherical roller in one row is $N1$, and the curvature radius of the inner raceway surface in contact with a spherical roller in the other row is $N2$, and the "special technical feature" of claims 13 to 19 is that at least one of the side surfaces of the middle flange of the inner ring in contact with the end face of a double-row spherical roller in a double-row self-aligning roller bearing has a flat surface.

There is no technical relationship between these inventions involving one or more of the same or corresponding special technical features, and therefore the inventions are not so linked as to form a single general inventive step.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

- ☒ all parts
- ☐ the parts relating to claims Nos. _____

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/JP2005/017277

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2-12, 14-19	YES
	Claims	1, 13	NO
Inventive step (IS)	Claims	7-12, 15	YES
	Claims	1-6, 13, 14, 16-19	NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

2. Citations and explanations:

Document 1: JP 2004-245251 A (NSK Ltd.),
02 September 2004, Fig. 1
Document 2: JP 10-184677 A (NSK Ltd.),
14 July 1998, Fig. 5
Document 3: JP 2004-19731 A (NTN Corp.),
22 January 2004, Figs. 5-6
Document 4: JP 2000-356218 A (NSK Ltd.),
26 December 2000, Fig. 9
Document 5: JP 2002-147449 A (NTN Corp.),
22 May 2002, Fig. 3
Document 6: JP 2003-130057 A (NTN Corp.),
08 May 2003, Figs. 2, 9, 11

As the invention of claim 1 is described in document 1 (Fig. 1), it does not appear to possess novelty or to involve an inventive step.

The inventions of claims 2 and 3 do not appear to involve an inventive step based on documents 1 and 2. Document 2 describes technology for configuring the outer ring with two separate outer rings and for applying a preload between the two outer rings. Use of the technology described in document 2 for the invention described in document 1 would be easy for a person skilled in the art.

The inventions of claims 4 and 5 do not appear to involve an inventive step based on documents 1 and 3. Document 3 describes technology for using symmetrical and asymmetrical rollers for a double-row self-aligning roller bearing. Use of the technology described in document 3 for the invention described in document 1 would be easy for a person skilled in the art.

The invention of claim 6 does not appear to involve an inventive step based on documents 1 and 4. Using the double-row self-aligning roller bearing described in document 1 as the bearing for the main shaft support structure of the wind-turbine generator described in document 4 would be easy for a person skilled in the art.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/017277

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

As the inventions of claims 13 and 17 are described in document 5 (Fig. 3), they do not appear to possess novelty or to involve an inventive step.

The invention of claim 14 does not appear to involve an inventive step based on documents 5 and 6. Document 6 describes technology for making the side surface of the middle flange a recessed curved surface. Use of the technology described in document 6 for the invention described in document 5 would be easy for a person skilled in the art.

The invention of claim 16 does not appear to involve an inventive step based on documents 3 and 5. Document 3 describes technology for use of asymmetrical rollers with the position of the maximum diameter of the roller shifted towards the middle flange. Use of the technology described in document 3 for the invention described in document 5 would be easy for a person skilled in the art.

The inventions of claims 18 and 19 do not appear to involve an inventive step based on documents 4 and 5. Using the double-row self-aligning roller bearing described in document 5 as the bearing for the main shaft support structure of the wind-turbine generator described in document 4 would be easy for a person skilled in the art.

The inventions of claims 7 to 12 and 15 are not described in any of the documents cited in the ISR, and they are not obvious to a person skilled in the art.